

IN THE CLAIMS:

1 1. (ORIGINAL) In a data link switching (DLSw) network, a method for improving in-
2 teraction between a first remote DLSw device coupled to a remote subnetwork including
3 a switch having a forwarding table and a local DLSw device coupled to a local subnet-
4 work including local end stations, the local DLSw device establishing a first logical peer
5 connection with the first remote DLSw device in response to a failure of a second remote
6 DLSw device, the method comprising the steps of:

7 at the first remote DLSw device, using configuration information to determine the
8 local end stations that are reachable through the first logical DLSw peer connection;

9 generating one or more test frames at the first remote DLSw device, the test
10 frames having source addresses comprising addresses of the reachable local end stations;

11 forwarding the test frames through the switch to force the switch to immediately
12 update the forwarding table with (i) a port identifier (ID) of a port receiving the test
13 frames at the switch and (ii) the source addresses of those frames.

1 2. (ORIGINAL) The method of Claim 1 wherein destination addresses of the frames are
2 group/multicast addresses and wherein the source and destination addresses are medium
3 access control (MAC) addresses.

1 3. (ORIGINAL) The method of Claim 2 wherein the test frames are Logical Link Con-
2 trol Type 1 (LLC1) TEST frames.

1 4. (ORIGINAL) The method of Claim 3 wherein the switch is an Ethernet switch.

1 5. (ORIGINAL) The method of Claim 4 wherein the step of using configuration infor-
2 mation comprises the step of learning the MAC addresses of the reachable local end sta-
3 tions via a MAC address list control vector of a DLSw Capabilities Exchange message
4 transmitted by the local DLSw device.

1 6. (ORIGINAL) The method of Claim 4 wherein the step of using configuration infor-
2 mation comprises the steps of:

3 scanning a list of statically-configured MAC addresses located within a configura-
4 tion file of the first remote DLSw device; and
5 determining whether a MAC address corresponds to the port ID of the local
6 DLSw device.

1 7. (ORIGINAL) The method of Claim 5 further comprising the steps of:

2 at the local DLSw device, monitoring the second remote DLSw device to deter-
3 mine when it becomes operational;

4 establishing a second logical connection between the local DLSw device and the
5 second remote DLSw device when the second remote DLSw device becomes operational;
6 destroying the first logical connection between the local DLSw device and the
7 first remote DLSw device.

1 8. (ORIGINAL) The method of Claim 7 further comprising the steps of:

2 issuing the DLSw Capabilities Exchange message including the MAC address list
3 control vector from the local DLSw device over the second logical connection to the sec-
4 ond remote DLSw device;
5 creating, at the second remote DLSw device, the LLC1 TEST frames using the
6 MAC addresses from the control vector as source MAC addresses of the frames;

7 sending the LLC1 TEST frames from the second remote device through an in-
8 coming port of the Ethernet switch; and
9 recording the source MAC addresses of the frame and a port ID of the incoming
10 port in the forwarding table, thereby forcing the Ethernet switch to update the forwarding
11 table.

1 9. (ORIGINAL) In a data link switching (DLSw) network, apparatus for improving in-
2 teraction between a first remote DLSw device coupled to a remote subnetwork including
3 remote end stations and a local DLSw device coupled to a local subnetwork including
4 local end stations, the local DLSw device establishing a first logical peer connection with
5 the first remote DLSw device in response to a failure of a second remote DLSw device,
6 the apparatus comprising:
7 a switch having a plurality of ports coupled to the remote DLSw devices and the
8 remote end stations, the switch including a forwarding table for storing addresses of the
9 local and remote end stations accessible through the ports;
10 a configuration data structure stored at the first remote DLSw device, the configu-
11 ration data structure used to determine the local end stations that are reachable through
12 the first logical DLSw peer connection;
13 at least one test frame structure generated by the first remote DLSw device, the
14 test frame structure having a source address comprising an address of a reachable local
15 end station; and
16 means for forwarding the test frame structure from the first remote DLSw device
17 and through the switch to force the switch to immediately update the forwarding table
18 with (i) a port identifier (ID) of a port receiving the test frame structure at the switch and
19 (ii) the source address of the test frame structure.

1 10. (ORIGINAL) The apparatus of Claim 9 wherein the switch is an Ethernet switch.

- 1 11. (ORIGINAL) The apparatus of Claim 10 wherein a destination address of the test
- 2 frame structure is a group/multicast address, and wherein the source and destination ad-
- 3 dresses are medium access control (MAC) addresses.

- 1 12. (ORIGINAL) The apparatus of Claim 11 wherein the test frame structure is a Logi-
- 2 cal Link Control Type 1 (LLC1) TEST frame.

- 1 13. (ORIGINAL) The apparatus of Claim 12 wherein the configuration data structure is
- 2 a MAC address list control vector of a DLSw Capabilities Exchange message transmitted
- 3 by the local DLSw device.

- 1 14. (ORIGINAL) The apparatus of Claim 12 wherein the configuration data structure is
- 2 a configuration file containing a list of statically-configured MAC addresses.

- 1 15. (ORIGINAL) The apparatus of Claim 13 wherein the first remote DLSw device is a
- 2 backup remote DLSw device and wherein the second remote DLSw device is a primary
- 3 remote DLSw device.

- 1 16. (ORIGINAL) The apparatus of Claim 13 wherein the first remote DLSw device is a
- 2 primary remote DLSw device and wherein the second remote DLSw device is a backup
- 3 remote DLSw device.

- 1 17. (PREVIOUSLY PRESENTED) In a data link switching (DLSw) network, apparatus
- 2 for improving interaction between a first remote DLSw device coupled to a remote sub-

3 network including a switch having a forwarding table and a local DLSw device coupled
4 to a local subnetwork including local end stations, the local DLSw device establishing a
5 first logical peer connection with the first remote DLSw device in response to a failure of
6 a second remote DLSw device, the apparatus comprising:

7 a configuration data structure stored at the first remote DLSw device, the configu-
8 ration data structure being used to determine the local end stations that are reachable
9 through the first logical DLSw peer connection;

10 at least one test frame structure generated by the first remote DLSw device, the
11 test frame structure having a source address comprising an address of a reachable local
12 end station; and

13 a forwarding mechanism for forwarding the test frame structure from the first re-
14 mote DLSw device and through the switch to force the switch to immediately update the
15 forwarding table with (i) a port identifier (ID) of a port receiving the test frame structure
16 at the switch and (ii) the source address of the test frame structure.

1 18. (CURRENTLY AMENDED) The apparatus of eClaim 17 wherein a destination ad-
2 dress of the test frame is a group/multicast address, and wherein the source and destina-
3 tion addresses are medium access control (MAC) addresses.

1 19. (CURRENTLY AMENDED) The method of Claim 2 17 wherein the test frame is a
2 Logical Link Control Type 1 (LLC1) TEST frame.

1 20. (CURRENTLY AMENDED) The apparatus of eClaim 17 wherein the switch is an
2 Ethernet switch.

1 21. (PREVIOUSLY PRESENTED) In a data link switching (DLSw) network, a method
2 for improving interaction between a first remote DLSw device coupled to a remote sub-
3 network including a switch having a forwarding table and a local DLSw device coupled
4 to a local subnetwork including local end stations, the local DLSw device establishing a
5 first logical peer connection with the first remote DLSw device in response to a failure of
6 a second remote DLSw device, the method comprising the steps of:

7 acquiring configuration information by way of a Capabilities Exchange message
8 having an appended control vector;

9 at the first remote DLSw device, using the configuration information to determine
10 the local end stations that are reachable through the first logical DLSw peer connection;

11 generating one or more test frames at the first remote DLSw device, the test
12 frames having source addresses having addresses of the reachable local end stations; and

13 forwarding the test frames through the switch to force the switch to immediately
14 update the forwarding table with (i) a port identifier (ID) of a port receiving the test
15 frames at the switch and (ii) the source addresses of those frames.

1 22. (PREVIOUSLY PRESENTED) A method as recited in Claim 21 wherein the con-
2 trol vector is a media access control (MAC) address list control vector.

1 23. (PREVIOUSLY PRESENTED) In a first data link switching (DLSw) device, a
2 method for improving interaction between the first DLSw device and a second DLSw
3 device, the method comprising the steps of:

4 acquiring configuration information by way of a Capabilities Exchange message;
5 using the configuration information to determine end stations that are reachable
6 through a logical DLSw peer connection with the second DLSw device;

7 generating one or more test frames, the test frames having source addresses hav-
8 ing addresses of the reachable end stations; and

9 forwarding the test frames towards a switch containing a forwarding table to force the
10 switch to immediately update the forwarding table with (i) a port identifier (ID) of a port
11 receiving the test frames at the switch and (ii) the source addresses of those frames.

1 24. (PREVIOUSLY PRESENTED) An apparatus for improving interaction between a
2 first data link switching (DLSw) device and a second DLSw device, the first DLSw de-
3 vice establishing a first logical peer connection with the second DLSw device, the appa-
4 ratus comprising:

5 a configuration data structure having configuration information used to determine
6 end stations that are reachable through the first logical peer connection;

7 at least one test frame structure generated by the first DLSw, the test frame having
8 a source address having an address of a reachable end station; and

9 means for forwarding the test frame structure towards a switch having a forward-
10 ing table to force the switch to immediately update the forwarding table with (i) a port
11 identifier (ID) of a port receiving the test frames at the switch and (ii) the source ad-
12 dresses of those frames.

1 25. (PREVIOUSLY PRESENTED) An apparatus for improving interaction between a
2 first data link switching (DLSw) device and a second DLSw device, the first DLSw de-
3 vice establishing a first logical peer connection with the second DLSw device, the appa-
4 ratus comprising:

5 means for acquiring configuration information by way of a Capabilities Exchange
6 message;

7 means for using the configuration information to determine end stations that are
8 reachable through a logical DLSw peer connection with the second DLSw device;

9 means for generating one or more test frames, the test frames having source ad-
10 dresses having addresses of the reachable end stations; and

11 means for forwarding the test frames towards a switch containing a forwarding
12 table to force the switch to immediately update the forwarding table with (i) a port identi-
13 fier (ID) of a port receiving the test frames at the switch and (ii) the source addresses of
14 those frames.